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ABSTRACT

Temporo-spatial surveillance of influenza-like illness: preliminary results from the Idaho infectious disease reporting network

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Objective
The objective of this study is to describe initial efforts to establish a real-time syndromic surveillance of influenza-like illness (ILI) in Idaho, using data from the Veterans Administration electronic medical record (Computerized Patient Record System (CPRS)).

Introduction
Current influenza-like illness (ILI) monitoring in Idaho is based on syndromic surveillance using laboratory data, combined with periodic person-to-person reports collected by Idaho state workers. This system relies on voluntary reporting.

Electronic medical records offer a method of obtaining data in an automated fashion. CPRS captures real-time visit information, vital signs, ICD-9, pharmacy, and lab data. The electronic medical record surveillance has been utilized for syndromic surveillance on a regional level.[1] Funds supporting expansion of electronic medical records offer increased ability for use in biosurveillance.[2] The addition of temporo-spatial modeling may improve identification of clusters of cases.[3] This abstract reviews our efforts to develop a real-time system of identifying ILI in Idaho using Veterans Administration data and temporo-spatial techniques.

Methods
The Boise Veterans Affairs Medical Center provides care to over 20,000 veterans living in Idaho with clinics in Boise, Caldwell, Twin Falls, Salmon, Idaho, Burns, and Oregon. Using retrospective data from the Veterans Integrated Service Network (VISN 20) data warehouse for the 2008–2009 influenza season, we identified ILI cases from these clinics using ICD-9 codes[4] collected as weekly counts. Duplicates and incompletes were removed, zip code was extracted, and clusters less than five per zip code were suppressed. We used SaTScan program v9.1.0 (SaTScan is a trademark of Martin Kulldorff. The SaTScan software was developed under the auspices of Martin Kuldorff, the National Cancer Institute and Farzad Mostashari at the New York City Department of Health and Mental Hygiene. Available from http://www.satscan.org) for cluster analysis, with Monte Carlo simulation for an expected incidence based on distribution of sample over time and space; geographic extent of cluster was not limited. We used ArcMap 10 (ArcGIS 10 is a product of Esri, Redlands, CA, 2010) for visualization on the basis of the United States Census Map data. The Veterans Administration Puget Sound Institutional Review Board (IRB) approved this study.

Results
We identified one primary and one significant secondary cluster ($P \leqslant 0.05$) of ILI (Figure 1). The relative risk was 7.8 for ILI in the primary cluster identified in southeast Idaho over a month-long period from 17 July 2009 to 20 August 2009. The secondary cluster in west–central Idaho occurred over a shorter two-week period in January. These results were shared with Idaho Public Health District directors, who confirmed the existence of an ILI cluster in southeast Idaho, the site of the primary cluster.

Limitations
We sampled a small percent of the state population; women and children are underrepresented.

Conclusions
Retrospective data obtained from VA electronic health records appear to be useful in locating ILI outbreaks in space and time. Further work is needed to evaluate the ability of our system to identify outbreaks in real time.

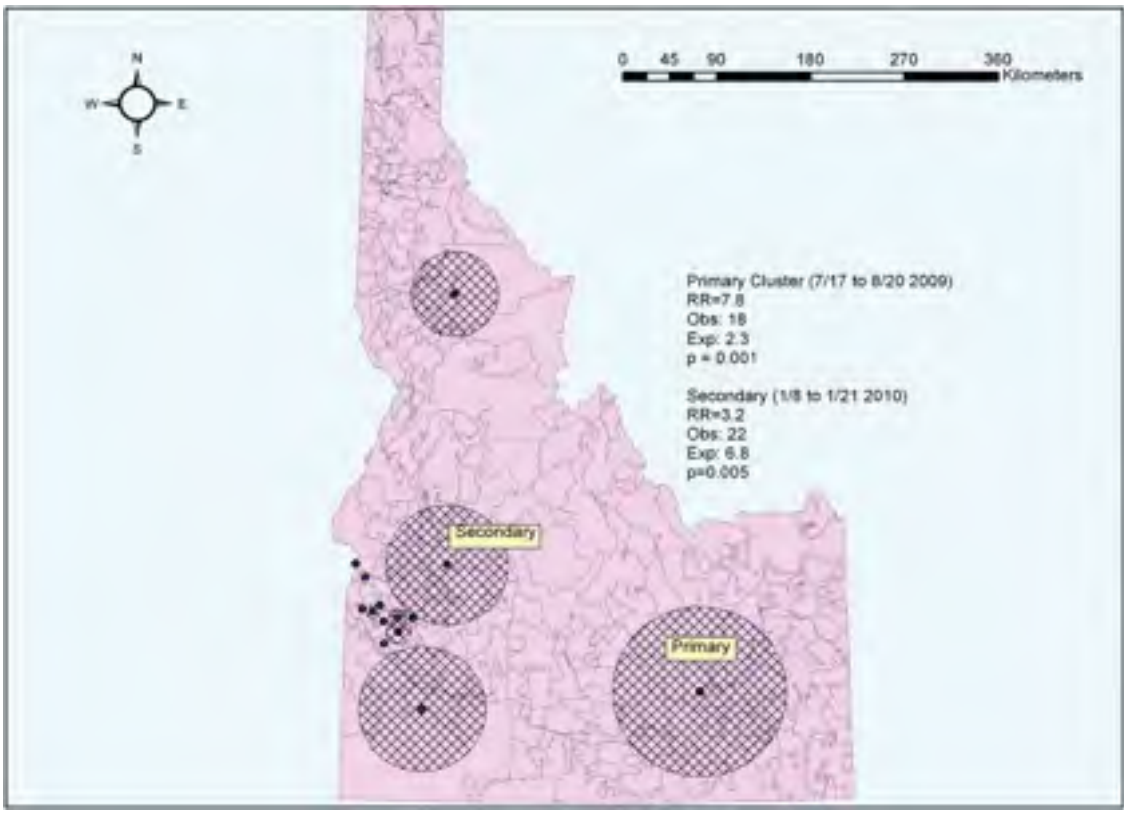

Figure 1 Primary and secondary cluster of ILI in the state of Idaho, 2008–2009 flu season.

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